

## Second Order MIMO Sliding Mode Controller for Nonlinear Modeled Wind Turbine

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**Abstract :** Due to the growing need for energy and limited fossil resources, the use of renewable energy, particularly wind is strongly favored. We all wind energy can't be saved. Betz law, 59% of the total kinetic energy of the wind turbine is extracting. Therefore turbine control to achieve maximum performance and maintain stable conditions seem necessary. In this article, we plan for a horizontal axis wind turbine variable-speed variable-pitch nonlinear controller to obtain maximum output power. The model presented in this article, including a wide range of wind turbines are horizontal axis. However, the parameters used in this model is from Vestas V29 225 kW wind turbine. We designed second order sliding mode controller, which was robust in the face of changes in wind speed and it eliminated chattering by using of super twisting algorithm. Finally, using MATLAB software to simulate the results we considered the accuracy of the simulation results.

**Keywords :** non linear controller, robust, sliding mode, kinetic energy

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